REMARKS

Applicants request reconsideration and allowance of the subject application in view of the foregoing amendments and the following remarks.

Claims 1-37, 40, 42-52, 54, 56, 57, 59-74, 76, 78-80, 82, 87-89, 91, 93, 94, 96-108, 110, and 113-116 are pending in the application. Claims 1, 11, 20, 26, 31-33, 51, 52, 65, 73, 74, 78-80, 96, 97, 108, and 113-116 are independent. Claims 1, 11, 20, 26, 31-33, 44, 51, 52, 65, 73, 74, 78-80, 91, 96, 97, 108, d110 and 113-116 have been amended herein. No new matter has been added.

In the Office Action, Claims 1-37, 40, 42-52, 54, 56, 57, 59-74, 76, 78-80, 82, 87-89, 91, 93, 94, 96-108, 110, and 113-116 were rejected under 35 U.S.C. § 102(e), as being anticipated by U.S. Patent No. 6,795,589 (Tlaskal et al.). This rejection is respectfully traversed. Nevertheless, without conceding the propriety of the rejection, each of the independent claims has been amended to even more clearly recite features of Applicants' invention. Support for these amendments can be found in the original specification, at least at page 17, lines 10-28, page 20, lines 23-29, and page 21, lines 12-22.

As presented, independent Claim 33 recites, *inter alia*, determining an obscurance region representation for the at least one node of the expression tree based on an analysis of the opacity region representation associated with at least one node of the expression tree, the obscurance region representation being separate from the opacity region representation of the at least one node and being assigned one or more of a plurality of further predetermined values, each further predetermined value distinctly identifying whether a corresponding region of at least one object is visible in the image. The Tlaskal et al. patent lacks such features of Applicants' invention.

In one particular, the Tlaskal et al. patent fails to disclose that the obscurance region representations for the at least one node are separate from the opacity region representation of the at least one node, as presently recited in independent Claim 33.

The Office Action appears to equate the "region groups" or "groups of regions," disclosed in the Tlaskal et al. patent, with both the opacity region representations and the obscurance region representations recited in independent Claim 33. However, as described in more detail below, the region groups and groups of regions disclosed in the Tlaskal et al. patent cannot be said to correspond to both the opacity region representations and the obscurance region representations of Applicants' invention, as recited in independent Claim 33.

The Office Action asserts on page 6, that opacity region representations are described in Figs. 2-18 of the Tlaskal et al. patent, and that associated with every node in a compositing tree is a group of mutually exclusive regions, wherein the opacity information are described in Table 1 (at column 12-14) which contains opaque, transparent and partially transparent values of the image regions.

Figs.1-24 of the Tlaskal et al. patent show compositing trees representing images and the different regions which exists in the images. Some of Figs. 1-24 list the compositing expression which would be used to generate the pixel data for each region before and after optimising the compositing expression. As disclosed at column 12, lines 48-57 of the Tlaskal et al. patent, every node in the compositing tree can have a group of regions associated with it, which together represent the region subdivision of the subtree of which the node is the root. The Tlaskal et al. patent discloses that using these principles, a compositing tree can be simplified dependent upon whether the graphical objects being composited are wholly opaque, wholly transparent or otherwise.

Table 1, at columns 12-14 of the Tlaskal et al. patent, lists compositing operations and the result of the compositing operations depending on whether the operands of the compositing operations are opaque or transparent (see column 12, lines 58-60 of the Tlaskal et al. patent). The Tlaskal et al. patent then discloses at columns 21- 24, a data model used for static rendering, comprising a region description and a proxy. Tlaskal et al. patent discloses at column 23, line 51 to column 24, line 19, that each region in a region group contains the following data:

(i) A Region Description: A low-level representation of the boundaries of the region. The region descriptions of all the regions in a region group must be mutually exclusive (non-intersecting, non-overlapping).

(ii) A Proxy: Some means of caching the pixel data resulting from applying the operation specified by the compositing expression at every pixel inside the region description. A proxy can be as simple as a 24-bit color bit-map, or something much more complicated (such as a run-length encoded description).

(iii) A Contents Label: A contents label represents a unique symbolic expression that describes the method of construction of image data. The terms in the symbolic expression distinguish between different categorisations of a source of image data. Therefore, the region groups of two distinct leaf nodes in the compositing tree will contain regions which are labelled with distinct contents labels even if their actual image data is equivalent.

(iv) A Flag Register: A general-purpose flag register used to store a state during the region group update process.

Accordingly, in this first instance, the Office Action appears to equate the "region groups" or "groups of regions" at each node in the compositing tree of the Tlaskal et al. patent with the "opacity region representations" of independent Claim 33.

However, the Office Action also states on page 6, that the Tlaskal et al. patent discloses "determining an obscurance region representation (*e.g., a quadtree representing the opaque and non-opaque regions for an image object*)", and "*[i]dentifying visible or transparent region or non-transparent areas or regions for a node versus the other nodes in the expression tree and thereby identifying the transparent regions associated with the expression tree wherein the region representation for children nodes are propagated towards the root in a bottom-up traversal of the image region compositing in column 18 and 21-22. See Figs. 1-24; column 12-18 21-24).*"

Accordingly, in this second instance, the Examiner appears to equate the "region groups" or groups of regions" at each node in the compositing tree of Tlaskal et al. patent with the "obscurance region representations" of claim 33.

For at least the foregoing reasons, Applicants submit that the Tlaskal et al. patent does not teach or suggest an obscurance region representation being separate from an opacity region representation of the at least one node, as presently recited in independent Claim 33.

Independent Claims 1, 11, 20, 26, 31, 32, 51, 52, 65, 73, 74, 78-80, 96, 97, 108, and 113-116 recite features similar to the foregoing feature of independent Claim 33, and are, therefore, allowable at least for reasons similar to those set forth above with respect to Claim 33.

In addition, Applicants submit that the Tlaskal et al. patent fails to teach or suggest determining an obscurance region representation for the at least one node of the expression tree based on an analysis of the opacity region representation associated with the at least one node of the expression tree, as presently recited in independent Claim 33. The Office Action contends, on page 6, that such a feature is met by the teaching in the Tlaskal et al. patent

of "a quadtree representing the opaque and non-opaque regions for an image object," at column 18 and 21-22 and Figs. 1-24.

However, as described at page 20, lines 23-29 of the present specification, obscurance analysis requires knowledge of the opacity information of each object, in the form of opacity quadtrees, so that regions where objects have been hidden or clipped out by other regions can be identified. These obscured regions are generally irregular in shape and can also be represented using quadtrees, referred to as obscurance quadtrees. Unlike opacity quadtrees, obscurance quadtrees preferably contain only two distinct node values instead of three. The two distinct node values being "1" where the object is hidden, and "0" where the object is visible. Obscurance quadtrees are computed from the opacity quadtrees, as described at page 21, lines 12-22 of the present specification. An obscurance quadtree represents the union of all obscured regions represented by a corresponding leaf node. As each node in a compositing tree inherits the obscured regions of the nodes parent node, the obscurance quadtrees are propagated in a downwards tree traversal. The process concludes with a final obscurance quadtree which can be used to limit the amount of processing required to render the graphics object corresponding to the particular leaf node.

In contrast, as described above, the Tlaskal et al. patent discloses that every node in the compositing tree can have associated with it a region group or group of regions which together represent the region subdivision of the subtree, of which the node is the root (see column 12, lines 48 to 57 of the Tlaskal et al. patent). Thus, Applicants submit that there is no disclosure in the Tlaskal et al. patent of an obscurance region representation for at least one node of the expression tree being determined based on an analysis of the opacity region representation associated with the at least one node of the expression tree.

Further, Applicant submits that the Tlaskal et al. patent fails to disclose or suggest "an obscurance region representation ... assigned one or more of a plurality of further predetermined values, each further predetermined value distinctly identifying whether a corresponding region of at least one object is visible in the image", as also presently recited in independent Claim 33. The Office Action, at page 7, appears to suggest that the terms "visible" and "transparent"are equivalent, stating that "[i]dentifying visible or transparent region and non-transparent region areas or regions for a node versus the other node in the expression tree ...." However, identifying transparent regions and non-transparent regions for a node versus other nodes in the tree, is not the same as, and does not directly suggest, identifying visible areas or regions for a node versus the other nodes in the expression tree, as recited in independent Claim 33.

Rather, transparency is a property of opacity, whereas, visibility refers to an object's ability to be seen.

Webster's Revised Unabridged Dictionary © 1996, 1998 Micra Inc., defines the term "transparent" as having the property of transmitting rays of light, so that dark bodies can be distinctly seen through; pervious to light; diaphanous: pellucid," as transparent glass; a transparent diamond;-- as opposed to opaque."

In addition, as described at page 17, lines 19 to 29 of the present specification, Fig. 1 (b) shows an example of an opacity quadtree 100 describing opacity information of an object 105 shown in Fig. 1 (a). The object 105 is a rectangle divided into two halves by a diagonal. The lower left half of the object 105 is opaque, while the upper right half is partially opaque (i.e., partially transparent). The partitioning of the object 105 is also shown in Fig. 1 (a) as square blocks under the object 105. As seen in Fig. 1 (b), the opacity quadtree 100 comprises

a number of internal and leaf nodes. Each leaf node is assigned a value of 'o', '-' or 'α' which represent the colors black, white and grey respectively, depending on whether a corresponding region in the image space is fully opaque, fully transparent, or partially transparent, respectively.

Therefore, as seen in Fig. 1(b), the second node from the left of level one of the quadtree 100 is grey representing a partially transparent square region of the object 105 at the top right hand corner of the object 105. As shown in Fig. l(a), that partially transparent square identified by the second node from the left of level one of the quadtree 100 is partially pervious to light or able to be seen through.

In contrast, the term "visible" is defined as "possible to see; perceptible to the eye: a visible object"(see The American Heritage Dictionary of the English Language, Fourth Edition Copyright 2000 by Houghton Mifflin Company Published by Houghton Mifflin Company). Accordingly, taking the plain meanings for the terms given above, "transparent" means "pervious to light", whereas "visible" means "possible to see". That is, transparency (or being transparent) is a property of an object, whereas, something being visible is the result of an action by another object. This is consistent with manner in which the term visible is used in the Tlaskal et al. patent, which states at column 1, lines 60-67, that "although the non-transparent area of a graphical element may of itself be of a certain size, it need not be entirely visible in a final image, or only a portion of the element may have an effect on the final image. For example, assume an image of a ceratin size is to be displayed on a display. If the image is positioned so that only the top left corner of the image is displayed by the display device, the remainder of the image is not displayed. The final image as displayed on the display device thus comprises the visible portion of the image, and the invisible portion in such a case need not be rendered."

Therefore, Applicants submit that the Tlaskal et al. patent does not teach or suggest "an obscurance region representation...distinctly identifying whether a corresponding region of the at least one object is visible in the image." At most, the Tlaskal et al. patent teaches a region group identifying whether a region in the region group is transparent or non-transparent.

Still further, the Office Action asserts, at page 6, that the Tlaskal et al. patent discloses determining an opacity region representation for at least one node of the expression, and states that "[a] compositing tree known as a quadtree is a group of mutually exclusive regions and the region group at the root of the tree may contain hundreds of regions; Figs. 1-24 and Table 1 of column 12-14." Thus, the Office Action appears to equate the term "compositing tree" with the term "quadtree." However, Applicants submit that a compositing tree is not the same as a quadtree. This is clear from both the present specification and the Tlaskal et al. patent.

For example, the present specification describes at page 2, lines 1-4, that several types of nodes (i.e., leaf nodes, unary notes, and binary nodes) may be combined to from a graphic object tree (GOB tree), as shown in Fig. 31. The present specification describes at page 1, lines 30 and 31, that binary nodes represent an operation which combines the pixel data of its two children to form a single result.

Similarly, the Tlaska et al. patent describes, at column 1, lines 34-56, that several types of nodes (i.e., leaf nodes, unary nodes, and binary nodes) may be combined to form a compositing tree, as shown in Fig. 1, and that binary nodes represent an operation which combines the pixel data of its two children to form a single result.

Accordingly, Applicants submit that the terms "GOB tree," "compositing tree" and "expression tree" are interchangeable.

In contrast, at page 17, lines 5-10, the present specification states that "quadtrees are hierarchical data structures [that partition] an image space into four equally sized quadrants, where each quadrant is further and successively partitioned until the quadrant represents a homogenous region of the image, or until some fixed depth is reached. Depth in this context refers to the number of levels in the quadtree representing the image."

The Tlaska et al. patent states at column 15, lines 13-24, that "[u]sing quadtrees, set operations are easy to implement and can represent a wide variety of regions given sufficient granularity (all edges in a quadtree have to be axis-parallel). Their major failing is that all quadtrees must be aligned on the same grid (granularity). This means that it is impossible to simply translate a quadtree by an arbitrary amount."

Accordingly, Applicants submit that the term "quadtree" does not have the same meaning as the terms "GOB tree," "compositing tree" and "expression tree."

For the foregoing as well as other reasons, Applicants submit that independent Claims 1, 11, 20, 26, 31-33, 51, 52, 65, 73, 74, 78-80, 96, 97, 108, and 113-116 are patentable over the Tlaskal et al. patent.

The dependent claims also are allowable for the reasons noted above with respect to the independent claims from which they depend, as well as for the additional features that they recite. Individual consideration of the dependent claims is requested.

In view of the foregoing amendments and remarks, Applicants respectfully request favorable reconsideration and early passage to issue of the present application.

Applicants submit that the present application is in condition for allowance. Favorable reconsideration, withdrawal of the rejection set forth in the above-noted Office Action, and an early Notice of Allowability are requested.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below listed address.

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